

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

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LOOSE-LEAF FIELD NOTEBOOK

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9-137

Ernstok  
Book!



A - Core 2

B - " 3

C - " 4

D - " 5

E - Core 4

F - " 5

G - " 6

H - " 7

I - " 8

J - Core 5

K - " 6

L - " 7

M - " 8

N - " 9

O - Core 7

P - " 8

Q - " 9

R - " 10

Dye Test notes  
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Notes on cuttings & cores -

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| 190-320 | 25, 36     | 2 - p. 11a      |
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F-1 Eniwetok, S. L. Flora

May 12 ~ Mon.

- No sample 0-10' as all measurements are from rotary table. No sample 10-20'. Only one sample sack taken for intervals 20-45', 45-55', & 55-60'. Two sample sacks filled thereafter.

Drilling plan is to drill with  $8\frac{3}{4}$ " bit to 150  $\pm$  ft., then ream hole, then insert  $13\frac{3}{8}$ " casing. Due to caving the samples to 150' are expected to be contaminated.

Drilling was very easy in very soft (unconsolidated) material to 57'; drilling slightly harder thereafter, but still easy. Hole caved slightly until rod was to be connected at 103'. Here caving was so bad that "Red mud" (650 lbs.) had to be added to drilling mud already consisting of Zeogel, Impermex, & Fibertex, & Gel flakes, (loss circulation material), & "Caustic". Caustic is Imperial Preservative.

Drilling ceased at 103' and about 7 P.M. Next rod was put on at beginning of night shift.

Samples taken from head of outlet trough and in front of a baffle in the trough.

R. C. Townsend sampling on swing shift.

May 13 - Tues - in Russell

Start - 10 3'

- Hard layer at 106' - 107'  
Sample at 110'



111' - Drilled hard again.

113 - " soft

120 - Sample - - Samples recovered are coarse fragments with sharp edges, apparently from cemented layers (120-130)

130' - Drilling stopped and bit lifted 2 ft off bottom & mud allowed to circulate. Sample taken after 5 minutes circulation (130-140)

140 - Sample (marked 140-150)

150' Sample (marked 150-160)

Note. Method of marking sample bags - for shore since my shift started at 110, 120, 130, 140, 150. When incorrect it seems to me that a bag of material taken when bit was at 140 should not be marked 150-160, but rather 140-150 please check. I will continue this system to end of this shift.

160' Sample - (marked 160-170)

161 - Added another stem

164 - Pulled string to ream.

A 17 1/2 inch bit was used to ream hole. This bit is too large to fit through the Table hole & had to be broken

A-1000 0 - Core 7

165  
3  
7

129.2 - 1000  
29.28 - incl  
156.53  
to 90 to 165

from the Kelly underneath  
the platform. This took from  
5.30 AM to 5.30 AM.

May 13 ~ Tuesday ~ 8 AM - 4 PM Last

7.15 reaming of LIS & change of  
shift; mud thick, purple.

7.45 Kelly down - T.D 129.25; bit  
wandering around considerably  
near end of run.

- 129.25

29.28 - rod added - about 8:30 AM

2.19 - cross-over 500

5.00 - on rod added at 9:10 AM

165.72 - to set casing

- balance of morning circulating while  
preparing to cement.

- at 1.00 pm ran TOTCO Drift record,  
finding hole off only  $\frac{1}{4}^{\circ}$  at 160'

- pull out of hole to set  $13\frac{3}{8}''$  casing

- remove rotary table opening too small  
for casing; build platform below derrick floor.

- 2.45 PM - start run casing

- 4.00 end of shift - trying to run 3rd section

(see p 6)

## Notes on cuttings ~ F1

- 20-45 A foraminiferal sand made up mainly of beach types such as Calcarina and Marginopora; most of former without spines but few with long spines of reef-flat type; broken Halimeda segments few also ech. spines; micro gast. in some abundance, few Hebertina along with numerous frags. of orange tubes prob. Tubipora. Frags. of polycypods common + some fine frag. of unident. origin, possibly coral.
- 45-55 Coarser, coral fragments + Halimeda abundant. Many complete Halimeda ~~fragments~~ segments, broken, some with coral fragments and a few Lithothamnion fragments. Tubipora fragments, and tubes (fragments) 1 cm. Small forms - calcarina, Tectularia, microgastropods in good state of preservation. Few columnar spines fragments of Hebertina. Rare Halimeda and Marginopora and cream-colored Calcarina. White shelly, agglut. Calcarina, numerous, M.R. Probably a calcareous deposit, and a drift of coral rubble and beach detritus.
- 55-60 Similar to last but with Halimeda much higher + many segments unbroken; more coral, thin-shelled bivalves - looks like lagoon fauna of intermediate depth - Marginopora and Calcarina rare.
- 60-70 Similar to 45-55; mostly Halimeda, bivalves numerous, corals rare; gast. with orig. color, few ech. spines.
- 70-80 Coarse Halimeda sand, similar to 45-55



80-90 Halimeda debris finer than last

90-100 Coral and Halimeda debris; few mollusks (s) as molds; Tubipora and Homotrema rare; Pyrgina unweathered free. (in separate vial).

100-110 Fine to medium coral and Halimeda debris; moll. fragments; rare beach-type forams & others (moll. mold rare, Tubipora, Homotrema, ech. spines).

110-120 Coarse coral fragments with rare Halimeda (contamination); few fragments of large mollusks; some of small, branching coral very fresh; beach forams in fair numbers but only a few of the Calcarinas have spines & most of these are broken.

120-130 Coarse coral similar to last with large pieces yellow calcite, most of coral pieces appear worn; very little fine material (forams, etc) in part of sample sieved; mud greatly thickened & this probably in large part explains absence of fines.

130-140 } Essentially, same as last

140-150 }

150-160 }

160-170 Similar to 120-130; some pieces of fine material well cemented (see sample). The interval 120-170 is mainly a well cemented coral rock; moll. mold & much yellow calcite - zone leached, no-Xl. & cemented - - -

170-180 } Similar to 120-130 (see Notes on Core #1)



May 13 "cont." 4 P.M. - 11:30 P.M. - TOWNSEND  
 4 P.M. Casing being set. At about 75' casing stopped dropping and went further only by repeated pulling and dropping. At about 100' casing refused to penetrate further. Hole apparently caved.  
 - Casing pulled and rods put on to drill out hole.  
 - Hole drilled out starting at about 9 P.M.  
 - Reaming to about 10 P.M.  
 - Circulated to end of shift trying to "build up mud" according to Springer.

May 14. Wed. 12 Mid night. - RUSSELL.

- Circulating mud to 1.35 AM. Crew building up mud in pit by addition of new sacks of mix.
- 1.40 - Started pulling string. Mud in good condition.
- 1.50 - Set string so that reaming bit is at about 100 feet. Attempted to clean off "ledge" (driller) which held up casing by whipping bit around at terrific speed.
- 3.15 AM. Circulating, bit on bottom.
- 4.30 AM - Stopped circulating and reamed hole at 100 + 90 - 120 levels.
- 4.50 AM. Stopped reaming - started circulating mud.
- 6.10 AM - Packed string mud down table - Prepared to set casing pipe.

Core 7

156

7.02.11.000 - Core 7 - 156 - 157



7:00 AM - Casing being run up to 100 ft -  
in same stand pipe as before.

May 14 - Wed - 7:30 AM - 4 PM - Ladd

7:40 - ran 4<sup>th</sup> length casing, 5<sup>th</sup> (last) section  
washed to bottom 158' below rotary  
table; clean sludge pit;

9:45 start to mix cement; pumped about 70  
bags thru casing before blow out; pumped mud  
on top cement to force it down but only  
recovered streaks from outside casing;  
pumped out sludge pit again and cleaned out  
around top casing preparing to cementing  
outside with concrete.

4 PM - 11:30 A.M.

4 PM - 3 yds. concrete set around casing in cellar.

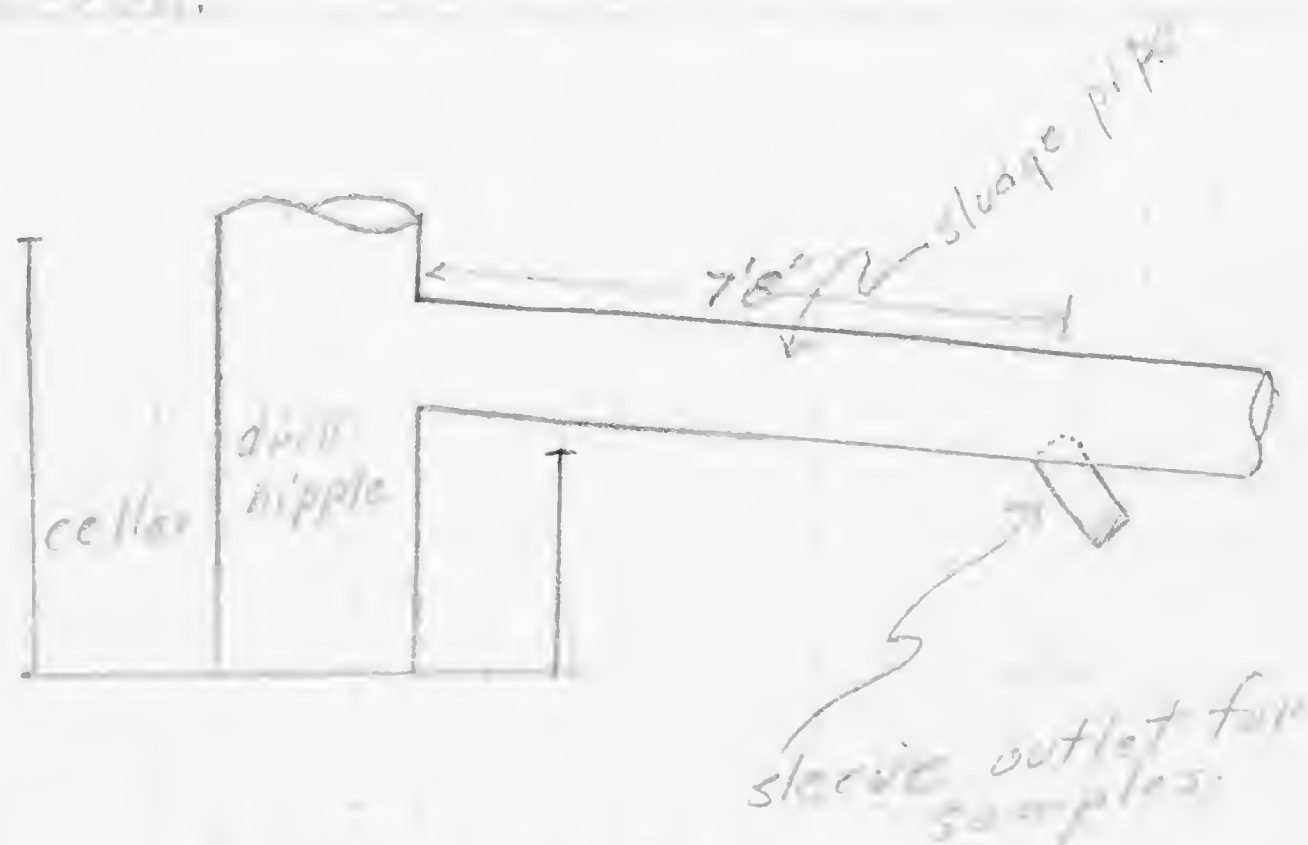
4:30 PM. - Rig shut down until cement & concrete  
sets. Crew cleaning and preparing rig for drilling  
when cement set.

May 15 ~ Thurs. - 8 AM - 4 PM - Ladd

Waiting on cement, building up mud; prep and  
accessories for casing cement.

4 PM - 11:30 P.M. Took mud  
samples in cement, and preparing rig for  
drilling tomorrow. Drill chisel set up  
drilling system consisting of 2<sup>1/2</sup>" pipe  
welded to the drill nipple below rotary  
table. This pipe is inclined downward  
slightly to carry sludge to pit. 7'8" from  
drill nipple a 2" sleeve is welded into  
the bottom of the sludge pipe and is  
inclined upward toward the casing. (1)

This sleeve is the outlet for sample collection.



2 AM - 5.30 No AME, 5.30 RUSSELL

1.45 AM. Casing cement drilled through - reached 170. Held drilling and circulated until 5.15. Prepared mud.

5.30 - Pulled string preparing to making first core - (core barrel is 25' - diamond bit).

6.00 AM - Lights went out - 3 minutes

Tex started his first dye test. Got one setback when quantities of thick black grease poured from core barrel and got us, we hope it didn't discolour mud enough to affect dye test. Cover on turntable may have prevented contamination.



Core 7

210 26  
~~206 34~~

192-4-1111-1011

7:45 AM - Samples of cuttings  
 during core taken with  
 megaphone and fine sieve.  
 Only one bag each of 170-180  
 and 180-190 intervals.  
 Towards upper dysconformity  
 showed color after 2:51 25  
 minutes of drilling time after  
 drill bit bottomed. In core sample  
 it should have shown from 3-4  
 minutes. In last 3 feet of  
 2 1/2 feet used, drilled harder  
 than rest - not see slant

7:58 AM - B. H. Spriggs says they  
 plan to go to 100 ft with  
 8 3/4" rock bit then beam with  
 larger bit.

May 16 - 8 AM - 4 PM Ladd

8:30 - pulled core bbl. with 1' ± of  
 core shell is fairly well cemented;  
 driller noted harder drilling in  
 last 3' ± core probably from this  
 interval - core less well cemented at bottom

going back into hole with 8 3/4" pack bit  
 to beam to 192.4 = bottom of  
 core (not 191)

11:15 - 12:20

|             |  |
|-------------|--|
| 192.4 - 200 | } coarse cuttings<br>of coral but all<br>soft drilling was<br>to driller |
| 210 - 220   |  |
| 220 - 230   |  |

41  
 173  
 191  
 - see over

see  
 p 25



"Coral head ls"

Coralliferous Halimeda ls.

Notes on Core #1 - 170 - 171

Recovery in 2 pieces - smaller one (top) 5" in length, larger one (bottom) 6 1/2" but base crumbled. Half of

Top of upper piece is a colony of coral that is not in position of growth; this colony and other smaller pieces of coral are embedded in a matrix of Halimeda segments, well preserved micro-mollusks, smaller Foraminifera and undet. finer debris. All foss. with orig. shell - no molds nor cavities of any sort suggesting solution. The material is moderately well cemented.

On Engobi it would be placed in the "coral head ls." group. The material probably is lagoonal, probably close to (or part of) a coral knoll

Lower, larger piece actually in 2 parts. The upper one 3 1/2" the other slightly smaller. This material is similar to that above but contains fewer and smaller corals and is more friable. It is composed primarily of Halimeda debris such as is found at intermediate depths in the existing lagoon.

Bottom piece with an abundance of coral (like the top piece) but friable; some of coral may be in position of growth; sides of core show cavities, these do not appear to be solution cavities but places where fines were washed out during coring.

All this material suggests intermediate lagoon depth near (or on) a coral knoll

of coral may be in position. Sides of core show cavities; these do not appear to be solution cavities but places where fines were washed out during coring.

All this core suggests intermediate lagoon depth near (or on) a coral knoll

(9a)

230-240 } - still soft but very  
240-250 } heavy cutting - coral  
+ shells

250-260 }  
260-270 } to 1 PM - note changing  
270-280 } texture  
280-290 }  
290-300 }

300-370 to 4 PM - cuttings plentiful  
- so plentiful about 5:20  
in 5 suggest some  
caving. All soft  
acc. to driller.

Collection of cuttings in each  
10' interval begun after 7' drilled  
down - at end each 10' interval  
string circulated until 2 sacks  
cuttings collected.

4 PM. to 11:30 PM. Townsend

4 PM. Drilled 570' to 600' - easy drilling &  
cuttings have higher proportion of fine  
fragments ( $\frac{1}{8}$ " & smaller). Some loss of  
cuttings and mud being carried up at end of  
day shift. Drill stopped at 600' to build  
up mud and screen to take mud.

8:29-8:54 AM - Took core with  $6\frac{1}{2}$ " (OD) x  
25' (ID) drill bit & mud. Core  
taken (5' interval) was fine with  
like material was present & had some  
cavities. (See Driller's coring report.) (10)





Coral limestone

Notes on Core #2 - 600 - 625' (see over)

Core consists of 3 oriented sections and 12 smaller unoriented pieces (one of these sent to Cole 5/19/52 as Sample 2)

Largest oriented piece is at top - length 5". It is a hard, <sup>recrystallized</sup> calcareous, coralliferous ls in which the corals without exception appear as molds. Some of cavities or fractures are filled with yellow calcite, others are filled with larger bits of same material. Most of determinable structure is that of coral; moll. molds poor. Many (if not all) of corals are obviously not in position of growth.

Small unoriented pieces are similar to above, middle oriented piece has many mollusk molds as does bottom piece - some of these may make id. squeezes.

→ Cole (5/26/52) gave 2 coral molds with  
Cole will break for sections later

Lee

resumed. both, could save for now  
4:45 AM - Samples collected  
To 976 ft - probably 975 ft  
Lost circulation at 975  
Driller (White) claims he hit hard rock at 975.

5:00 AM Pumped mud for  
minutes with no return of  
circulation. Decided to pump  
string & ream trying debris  
in reaming will help  
plug hole - 1 A 5/8" drill bit  
to check depth, by  
thrusting as he comes out  
- this done, depth OK.  
- Built up mud, into hole at close shift 18940 ±

[Note: yesterday, acc. to Springer, circulation  
failed momentarily on several occasions  
& he was tempted to shut down but each  
time flow returned HFL]

May 17 ~ Sat. 8 AM - 4 PM - HFL led  
- out of hole on acct plugged bit  
9:45 start back in hole with 12" rock bit  
to ream  
10:25 regained circulation - reaming  
12:45 down to 592'  
1:45 " " 520'  
3:15 " " 756' - not losing much mud  
- only what would be expected in  
ream to hole.  
4:45 down to 800'

8:20 - Pumped out mud, reamed  
to 905 ft. (12)



Core 7



— 12" Security  
Hole, open for  
seismic

—  $8\frac{3}{4}$ " bit

Core at 1225' in before of  
hole made in 1225'

12a

4 P.M. - 11:30 P.M.

At start of shift tool being removed because bit plugged. Tool down hole at 8:20 P.M. 8 3/4" bit with 12" security reamer being used to clean out hole. Reaming started at 905'. When new pipe joint was added at 934', mud flowed freely from top of pipe in hole after the Kelly was removed and entire next pipe was added. Bill Springer says this is due to weight of cuttings outside of hole pipe being mud up the inside of the pipe.

9 P.M. - Bit down to 963'. Then circled. 9:21 P.M. Circulation lost completely at 989' ± 2'. Driller continued to drill without return of mud. Driller says it drilled fairly hard just before losing water; then bit dropped rapidly for 3-4' and drilled harder again. Another "soft" spot 3-4' hit in the 990-1000' interval.

9:48 P.M. Drilled 1000'-1020' interval in 3 min. Drilled 'dry' (no mud return) to 1021'. No samples available from 980' to 1025'. At 1021' pipe pulled. Pipe cut & pipe being cleaned preparatory to being moved at end of shift.

May 18, 1952 - 12.00 Mid - 8:00 AM - Russell

12.00 Mid - cleaning slush pits. Preparing new batch of mud. (Tide 6:00 AM when I left for Bradford)

May 18 ~ 8 AM - 4 PM - Ludd  
Sunday

Into hole with 8 3/4" rock bit; down to 1035' ± by 10:30, drilling dry; called Coray for emergency shipment of Zeogel (400 sacks), Gel flake (25), Fibertex (25) and Tanner (2 drums)

O - Core 7

this prob. silt  
zone covered  
at Engabi

- Circulation back at 9:40 from 1045±,  
return almost clear water: some very



this prob. silt  
zone covered  
at Engeli

- Circulation back at 9:40 from 1045±, return almost clear water; some very chalky lime but no chips -
- coarser material appears 1045±
- 10 sec - down to 1075 (100' below cavity)
- handled up about 1083'
- 11:00 AM - at 1130' - only very fine cuttings - most going into cavity still? circulation strong
- 11:15 AM - 1130-40' - circulating to mix more mud; cuttings still very fine; may be mostly from top layers
- 11:40 AM - at 1160' - no change
- 12:30 PM - at 1210' - cuttings very light -
- continue to mix more mud
- 1 PM pulling out about 200 feet to await more Jefflake, etc. ordered from Parry early this morning.
- 2:45 PM Mixing mud.

#### 4 P.M. - 11:30 P.M.

Mixing mud to 4:30. About 200' pipe pulled out at 4:30 to get on bottom.

4:40 - started drilling at 1020

4:50 - hit hard zone at 1032' & decided to take a core.

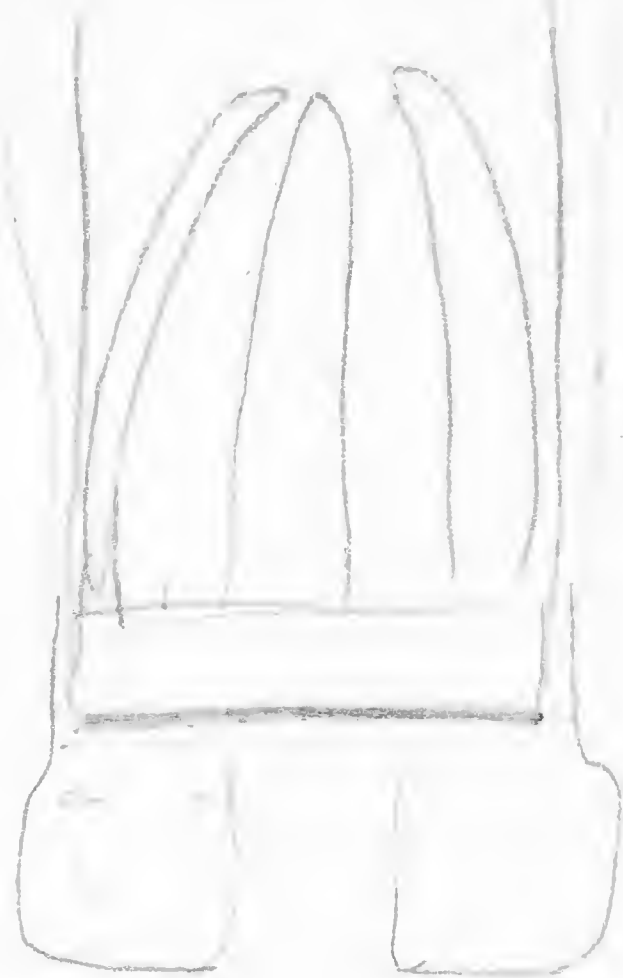
Sample 1220 to 1230 taken at 1232.

Sample 1230 to 1240 taken at 1232.

1210?

O - Core 7

5:00  
5:30



10/11/50  
7.5  
14.4

5:03 - Started to pull pipe out of core

5:03 - Started to pull pipe out of hole  
5:17 - Started to core with 25' pipe  
6 1/4' (100%) & 3 1/2' (75%) recovered. Drilling  
says it drilled hard at first. Drilling  
very slow throughout & no flow seen. Water  
is hard with only occasional small  
streaks.

5:17 Started to core with 25' pipe  
6 1/4' (100%) & 3 1/2' (75%) recovered. Drilling  
says it drilled hard at first. Drilling  
very slow throughout & no flow seen. Water  
is hard with only occasional small  
streaks.

Logging some drilling fluid throughout the  
core.

Coring complete at 10:00 P.M. Pipe pulled.  
11:25 Core out. 11 ft. core recovered from 16  
feet of drilling - 69% recovery.

Circulation apparently lost at end of coring.

May 19 1952 - 12 midnight - Dr. Burdick  
Description of core #3 (1232-1248)

Length - Total 11 feet.  
Recovery 69% of 16 ft drilled.  
Consists of 23 pieces of oriented  
core, ranging in length from  
2 1/2 inches to 9 inches, 15 pieces  
of unoriented core ranging in  
size from 3 inches to 3/4 inch  
and one bag of gravel size core  
recovered immediately above  
lowermost oriented piece of core.  
Each piece of oriented core is  
marked with a T on uppermost  
surface and placed in core box  
with top surface to left. Individual  
pieces were not numbered in sequence  
so that care should be taken to  
keep them in proper order when  
removing from core box.

core  
#3  
1232-48  
-see pp.  
15a  
15b  
16



12.5 AM - Have been wiping mud lines  
midnight.

4.00 AM - Mud lady, preparing to  
go back in hole with 8 1/4 bit.  
Turned out to run dry test  
with 8 1/4 bit.

4.45. Pumped to 1244' & lost 6 inches  
of mud with no return of  
circulation.

5.05 AM. Practically nothing appearing  
bit from 1248' to 1260'. Bit held  
back at 1260'. Still no circulation.  
About 18 inches of mud lost  
at 1260'. Fully circulating  
at 1266'. Spinning mud  
to 1272' but not flowing.  
From 1264' to 1272' is hard  
drilling.

5.13 AM. A total of 25 inches of mud lost  
since bit was returned to hole  
after coming out on drilling to  
1272' - no return of circulation.  
Commenced pumping & drilling at  
1277' (5.14 AM) & lost 10  
more inches.  
Rotating slowly without pumping  
at 1277' & off bottom.

See back of this page for detail  
section from 1232' to 1272'.

- see p. 16 for notes on core.

15a1

is and mollusks are preserved in  
some of deeper sections of core  
return what appear to be larger  
but most are recrystallized and  
none may not be possible. Sent  
to Cole (4th oriented piece from  
lower)

15



1232-1246 Hard green ls. (See core 8)

1246-1248 Very ls. irregular, some irregular ls. (ls at two feet of core seen)

1248-1256 Extremely irregular, with large 110's filled with ls. with internal, of only 1 inch to 1 foot of sufficient formation to retard drill

1256-1264 firm ls. but easy to drill

1264-1272 Hard ls. with thin layers (possibly green)

1272-1280 100' depth, very hard - 100' depth, very hard

1232-1248 - Hard to start pump  
(probably jammed)

150-

5.30 AM - Sp. Sig. kept going -  
Sp. Sig. kept going to 1.00 PM  
keep drilling without circulation,  
but keep pumping pressure up.

5.45 AM - Pumping stopped - water  
shut into bottom. Back on  
pump at 5.55 AM.

6.05 AM - Pumping started again - water  
shut into bottom. Back on pump.

NOTE: No samples taken from  
1240 to 1248 (low) and from  
1248 to 1270 (lost circulation)

May 19 ~ 1901 8 AM - 4 PM - Ladd

- Delayed by failure of gas engine that  
starts big diesels. Start back to bottom  
at 9:20 AM; same casing - back on  
bottom (1272') at 10 AM. Moved cement  
pump to shore, to increase volume water.  
- and no (ugh!) circulation!  
- 10:10 - drilling hard at 1285' (5' beyond Eng. bi)  
- shut down to complete pump installation, etc.  
1290 ±

Core #3  
1232-48

Note: - Limestone of core 1232-1248 is dense  
and recrystallized with irregular cavities left  
by the removal of corals and other material.  
All of corals and mollusks are preserved as  
molds; some of denser sections of core  
contain ~~corals~~ what appear to be larger  
forams but most are recrystallized and  
identifications may not be possible. Sent  
chips to Cole for oriented piece from  
(over)

Core B



Core 7

Core #3 (spec. B) - Cole reports  
(5/26/52) - has Cyathocypus - may  
be Ceidae - if so in Tert. e;  
also Amphistegina

bottom). This layer was predicted on basis of Engobi drilling and may be the same as the "Lill" layer of Bitini that is Miocene f and records a time (late f or early g) when this part of section stood above sea level & corals, etc. were dissolved (Miocene g shells above Lill layer were not so altered.) The emergence definitely not assoc with Pleistocene change of level.

4 PM. - 11:30 PM.

- Rig shut down at beginning of shift.
- 5:02 Started drilling at 1244'
  - 6:00 Stopped drilling at 1312' because all water used up. Drilling this 18' was only "fairly hard" with two salt breaks. No circulation on drilling. Filled pit with water.
  - 7:41 Drilled 1312' to 1341' before lost water again. Stopped drilling, 3:02. Filled pit with water.
  - 10:43 Started drilling again at 1341'.
  - 11:22 Stopped drilling at 1388.72'
- All drilling on this shift done with salt water & no return - (except water out). Drilling only first 12 1/2 hours from 12:45 to 13:55. Drill on logs indicated very little.

May 10 - 12 PM To 8 AM.

Mr. Russell.

- 1388 -
- 12:36 PM Drilled to 1446 with salt water. No circulation. Rock firm but losing to drill.
  - (1424 - 1426 - Very hard)
  - 1426 - 1434 - Fairly hard
  - 1434 - 1446 - Drilling with no resistance)
  - 1446 - 1450 - Fairly hard
  - 12:00 - Filling pits with water.





1:40 AM - Resumed drilling with salt water pump going. Bit had to go through 15' last of cement material in each bottom.  
Drilling hard rock at 1450.

1450 - 1455 - Hard rock - 12 minutes to drill with 14,000 lbs on bit.

1455 - 1477 - Dropped 22 feet in one minute - no resistance. Added new stem.

2:15 AM.

1477 - 1506 - Dropped entire 29 feet in 3 minutes - Not more than 2 feet total resistance all way down, each spot being in matter of inches.

1506 - 1510 - Free drop.

1510 - 1515 - Soft

1515 - 1520 - fairly hard

1520 - 1525 - pulling spring chatter caused by bit hitting something solid on only one side of hole - either very soft or cavity on other side - Chatters every 3 or 4 feet - Rock fairly hard.

1520 - 1530 - Took 10 minutes

with 15,000 lbs on bit - Fairly hard

1530 - 1533 - Fairly hard

1533 - 1535 - Free drop.

2:00 AM - Stopped to fill pits.

C

✓

12  
22  
32

5.10 PM. Returned to ship. Still not going  
to look at diamond material. End.

5.10 AM - Resumed drilling. 3 to 40 ft. from  
25 feet slumped material had  
be recharged to rock bottom, hole  
being held to full back after  
recharging 30 ft.

5.20 - Drilling in 1535-1540 zone  
with chattering & spalling  
frequently. 11,000 speed of  
rotation - 16,000 lbs on bit

1540-1565 - Drilling fairly hard to  
S&S rock but full back  
chatter at 1550.

(Note: From 1535 to 1565, except for  
one cavity at 1550 the rock seemed  
to be all hard & fairly hard but  
chattering of drill indicated an uneven  
(probably sandy, texture)

5.59 AM - Bit froze at 1567 ft.  
Took 45 seconds of drilling manipulation  
to free. Drill chattering and backing  
very strongly.

6.02 AM - Stopped drilling at 1570'  
To refill pits.

6.10 - To end of shift - Refilling pits.

Summary - of this shift.

Of 182 feet drilled (1388 - 1570)  
most is fairly hard, sandy material  
which caused drilling to chatter & back.  
Driller reported 4 zones of open





consists of extremely coarse sand, 12 ft, 55 ft, 2 ft and 1 ft thick respectively. It is quite possible that there are no beds with gravelly sand, but some of very loose sand, which the pump is unable to pump. I am afraid of the bit. One possible argument for this is that there is always caved material in the hole when drilling is resumed after filling pits - even when drilling has been stopped in the middle of "bar shop." (Note that from 1532-1535 - refill pits, - 25 ft of caved material when drilling resumed.) No circulation this shift. All drilling done with sea water. No samples collected.

May 20 - Tues 8 AM - 4 PM Ladd  
Rpt. #3-7  
to ONR

Shot down at start of shift to complete filling of pits and to continue work on one of pumps that is still not operating satisfactorily.

- Back into hole at 8:30, drilling through 55' caving
- 8:37 on bottom at 1570
- 8:50 down to 1593; drilled mostly with low pressure, but barden near top of interval last 10 feet soft; pulled out to add another length but hole had caved and pipe would not run; put Kelly back and drilled out.

9:15 added another length drilled to  
1622'; interval almost uniformly  
hard; drilled smoothly except  
for 2 spots of broken material  
where pressure was raised.  
Driller figures this interval hard  
enough to core - would also make good  
casing seat; circulated for 10 min  
at end of run to clean out hole  
Pits over half empty after 2 runs.

9:55 added another length - will make <sup>T.D. 1653'</sup> 1583'  
start firm with 10,000 lbs. on bit.

10:03 pulled off bottom to refill pits;  
last of water went out quickly;  
- string sluggish due to fill;  
driller pulls out 4 stands while  
pits are filled

5:12 pm

10:20 Connected Pressure & Casing  
Pressure 115

11:45 Put end of last section down  
Pressure 115 to 1622'

11:55 At 1587 ran into cutting note  
Casing at 1622' to start then  
took 15 minutes to pull back to  
1622' at 2000 lbs. (115) Circulated  
Casing 5 minutes

12:02 Added new pipe section down to  
1622'





11000 ft. depth, 1000 ft. below surface, 1000 ft. below surface.  
Coke, 1000 ft. below surface.

- encountered fairly hard rock at 1712,

encountered fairly hard rock at 1712,  
drilled to 1718'; circulating prior to coming  
out for core bbl.

2. no starting out of hole



11:20

Drilling with 2 1/2 inch bit. Proceeded to 10' below the surface. The hole was 10' deep. The bottom was 10' below the surface. The hole was 10' deep. The bottom was 10' below the surface.

11:30 to end of shift at 11:30

Drilling with 2 1/2 inch bit. No drilling.

Cove #4

Cove #1  
(Sump 26)  
1715-40

Cove #4. This shift, 1712'-1740' consists of 18 oriented pieces 2 1/2" - 9" in length. 4'-4 1/2' of the top of the core appears to be a nearly continuous section. Below this, gravel up to 2 1/2" in diameter was recovered between the larger oriented pieces. This probably represents discontinuous recovery.

The largest part of the core consists of dense to finely porous, white, fossiliferous limestone some of which has a rust-colored stain apparently due to the drilling operation.

Top of oriented piece marked with a black ink T.

May 1

Wed. Midnight - 8 AM. Russell

12:50 AM. Mixing muds  
170 Shells 3/4 gal  
80 " 1/2 gal  
1/4 surf cement  
20 gal Tannex  
Cellulose 7/8 gal

3:40 AM. Started back on hole. Had bridge at 1003. Driller explained that 11 inch hole goes to 1021 (8 3/4 below that) and that cavings had plugged at this narrowing point.

Tried locking stem in rotary (24)

table and rotating to free.  
Didn't rotate - just kept on  
drill through. I was drilling  
a few minutes before reaching  
because pressure on  
"Must be a boulder, its harder  
than hell" (Miller).  
Lost 2 inches more, no strain  
on drilling through boulder (2 feet)

4.30 pm Bridge again at 1643.  
Boulder, though going down for  
a while, very close to it  
17.00 - drill it out (5 feet)

4.45 pm Bridged again Sat. 1643  
Had to drill through

5.15 Steam runs into, carrying at  
1700' - probably falling 1000 ft  
to bottom

5.45. Reached bottom of hole after redrilling  
through core of section.  
- Drill shaft to rotary table broke.  
- Cement pump failed (pump)  
- See note on page 27  
- Started pulling out of hole to make  
- again

May 21 ~ Wed ~ 1 AM - 4 PM Lat - FITZPATRICK

CE45 REPAIRS ON EQUIPMENT COMPLETE  
BEGAN PULLING DOWN PIPE - CEMENT PUMP  
AT 1740

(TO PAGE 27)

Sample 4 - see # number of unoriented  
pieces 7'8" from top of core - K 100-5/21/56

Sample 5 - see top from bottom of oriented  
piece 8' from top of core (piece at left of  
3rd channel in core box) to calc 5/21/56

25a

Note on Core No 4 - 1918-1940



Notes on Core No 4 - 1718-1740'

First 2 pieces, each 6' in length, have a sandy texture with traces of horizontal bedding. The material is porous and only moderately well cemented. It is composed almost entirely of Foraminifera - both the smaller discoid "beach types" and the larger lepidocyclines. They appear to be beautifully preserved. External appearances suggest Miocene forms from Lau and I think we are still in the Tertiary E unit. The large numbers of smaller forams suggest very shallow water (possibly even a beach). Chips from the base of upper piece ("C") and from base of lower piece ("D") sent to Cole - 5/21/52.

First 4' of core (possibly 4 1/2') form an unbroken section and starting with piece 3 (1' from top of core) ls. becomes dense. A few small cavities and cracks are veneered with minute calcite xls but rock is not recryst. Same large forams are present and are as well preserved as those above; sections of large calcite xls probably represent echinoid spines. (Specimen E from base of 4 1/2' piece sent to Cole 5/21/52)

Sixth piece has number molds of branching coral (1" or slightly more) and other molds that probably represent mollusks; rock in 6<sup>th</sup> + 7<sup>th</sup> still dense + white + well preserved forams persist; balance of first 4 1/2' similar.

Piece 1' 5" from top of core has good forams in dense matrix (Sample F to Cole 5/21/52)

Sample 6' from top core has well preserved coral molds (Sample G to Cole for Wells 5/21/52)

C705

BEGIN DRILLING AT 1740'

1740-41 HARD WITH VOIDS

C720

41-50 HARD SMOOTH DRILLING

50-53 FEELING SMOOTH SMOOTH

DRILLING SMOOTH

53-54 SOFT WITH VOIDS

54-55 " AND SMOOTH

55-60: SOFT SMOOTH, WITH FEW  
VOIDS

60-62 HARD SMOOTH SMOOTH MID

62-63 SOFT AND SMOOTH

63 VERY SOFT

63-64 SOFT AND SMOOTH

64-65 SOFT WITH VOIDS

C934

65-67 VERY SOFT WITH FEW HARD  
SMOOTH AT 67

CIRCULATE FOR 7-8 MINUTES

C942

BEGIN DRILLING AT 1769' HARD, SMOOTH

C950

1770-71 SOFT WITH VOIDS

71-75 VERY SOFT, SMOOTH, WITH  
OCCASIONAL VOIDS

85-89 GETTING HARD

89-90 VERY SOFT, SMOOTH

1009

AT 90 LAST HARD FROM THEN STRATA

70-97 HARD SOFT AND SMOOTH WITH  
OCCASIONAL VOIDS

BEGIN CIRCULATING &amp; CONNECTING

1015

BEGIN DRILLING AT 1797'

1797-1805 SOFT WITH MANY VOIDS

1805-07 FEELING SOFT SMOOTH

07-12 VERY SOFT WITH VOIDS

12-16 SMOOTH, HARD

16-18 SOFT WITH MANY VOIDS

18-27 VERY SOFT, SMOOTH, SMOOTH DRILLING

NOTE: WATER IS NOT BEING USED

AS FAST AS IN PREVIOUS DRILLING

1027

848 - DRILLING AT 1027

1027-31 SOFT WITH VOIDS

31-34 HARD, SMOOTH

34 VERY RUUGH DRILL

34-46 VERY SOFT OCCASIONAL  
VOIDS FAIRLY CHANGING  
FROM 38 TO 40 LONG  
FALL THRU

46-47 VERY HARD, SMOOTH

47-48 HARD WITH VOIDS

48-51 SOFT, MANY VOIDS

51 SOFT HARD, SMOOTH

52-53 " " WITH VOIDS

1057

53-57 VERY SOFT WITH MANY  
LONG DRILLING

RECORDING PITS, CONSECUTIVE CORRELATIONS  
BEGIN DRILLING 1057

1130

1051-62 HARD WITH VERY FEW VOIDS

1060

62-64 SOFT, SMOOTH

64-66 SOFT WITH MANY VOIDS

CH VOIDS, FAIRLY EVENLY  
SPACED THROUGHOUT. COLL  
REMARKS FALL FROM  
HOUR 1060-1068

1170

AT 1076

1500 DRILLING AT 1076

1076-80 SOFT, SMOOTH

1080

1080-94 SOFT, SMOOTH

94 VERY RUUGH

1094-1914 VERY SOFT - BIT OCCASION  
FROM 1098-1914

14-15 SOFT WITH VOIDS

1914-1916 VERY HARD FAIRLY  
SMOOTH



152

1817

BEER Sept 22 1876

78.5.

75-1960

55-65 FARMER FARMER

50 16 507 1414 63105

70-75 FRANK HARD

1342

At 1375'

IT HAS BEEN DECIDED TO USE THIS LAST  
HARD ZONE AS A CASINE SEAT. HERE  
IS TO BE REAMED (ABOUT 1 DAY REQUIRED)  
CASINE, BUT. DOWN (ABOUT 4 HRS), AND  
THEN COATED (ABOUT 1 1/2 DAYS) —  
ESTIMATED TIME TO BEGIN OPERATIONS  
ABOUT 14 MAY.

4 PM - 11:30 PM.

7120 Skipped to 7176.

May 22 - Thurs. - Laid

64) 2M - returned to 1236' - very hard going  
near end of run (this the unit cord  
earlier); new joint added without  
any fill but still no return of mud.

6155-4-270

7:06 AM - removed to 1320 - very rough  
just 5'; replaced bolts on water  
bushing.

10120 - 101409

1100 - 1458

2131 - 70 / 526'

5 PM - reamed to 1549 (due to error in  
pipe tally depths during shift up  
to this point are off by about 30')

4-11-57 PM.

Drill string at 1535. 3 1/2". New bit

7 mud mixed.

8:00 - reamer to top of hole and run

9:00 - run and all gone. 2 1/2" mud mixed.

10:00 - run and all gone. 2 1/2" mud mixed. 2 1/2" mud mixed.

11:00 - run and all gone. 2 1/2" mud mixed. 2 1/2" mud mixed.

12:00 - run and all gone. 2 1/2" mud mixed. 2 1/2" mud mixed.

May 23 ~ Fri. ~ Ladd 8 AM - 4 PM

Heavy covering continued. Even with  
reamer removed, down to 1710 at 8:15 AM  
hole tight, unable to make connection;  
to add third pump so as to avoid  
leaving white pits are being refilled;  
will probably have to mix more mud  
to get Kelly down to 1740.

8:40 - trying to pull out 3-4 stands to  
mix mud - done by 9 AM

Added 50 lb dust (100 lbs + 1 lb) to mud; start  
back up at 2:00 PM - down to 1500' ±  
in clearing up to 2000' by 3:45 with  
no return of circulation; mud more  
than 1/3 gone; to pump remainder  
in hole and then pull out before  
putting on reamer (hole now reamed to 1526')



4 PM. 11:50 PM. Started mixing mud at beginning of shift. Mixed mud until 7 PM. Mud in the bins:

5000 2010

25 grains. Tenor

1008 105 101 7.5

4:00 P.M. Rained to 1730. Pulled  
3 strings to fill pits. Cuttings  
went to about 40 ft of  
bottom of second hole.

7:30  
AM Reaming at 1754' (section where we had  
trouble yesterday) with salt water.  
pulling up to mix mud; 10:15 start  
back in hole; 10:25 down to 1820 ± -  
drilling mostly easy but with few  
hard streaks that cause much chatter.

Rept. #4 →  
to OMR.

Concrete pump moved from shore to rig.  
Preparations made to run casing and  
cement casing. All three crews on duty.

222

May 25 ~ Sun

1973

Casing run to ~~4775~~ and hole  
cemented by 7PM. shut down to allow  
cement to set; to resume drilling 6AM  
5/27.

May 27 ~ Tues

5:40 AM - 4 PM (Cody)

- Bit at 1936' (1978.7 with K.D.) - start  
drilling slowly to clean out cement;  
use water (when mud is used with cement  
drilling it "clobbers up") - good return water.  
(first touched cement 1963')
- 1975-78 drills hard, cuttings medium  
to fine, include cement and bits of black  
material from shoe; circulate for  
45 min. to clean hole before running  
core bbl. Ran Totco 1963 (1° off)
  - Cutting dense, hard, white to tan  
or slightly pink rexl. ls.; some banded  
structure (algal?), very few chips are  
cavernous; <sup>some</sup> show ~~some~~ coral structure;  
well preserved larger forams present.
  - 6:40 - 7:30 - out of hole
  - 8:00 start down with core bbl.

[Note: yesterday men on lagoon <sup>acc Johnson</sup> close to  
drill site reported muddy water in 3 spots]

8:43 core return

- 8:50 - start coring - "moderately hard"

- 10:15 few fine cuttings - thin plates hard  
white ls. - sample in vial

- 10:45 averaging 7-8 min/ft; one (see p. 37)



190 - 210 Coral head 3 )  
 210 - 230 Shell ls )  
 230 - 280 Coral head ls  
 280 - 300 Coral + shell - fine  
 300 - 330 " " " - coarse

Notes on cycling ~ F / (see above)

190-200

Sample consists mostly of large pieces of coral (Porites) up to 1 1/2" in diameter.

Notes on samples ~ F 1 (see above)

190-200 Sample consists mostly of large pieces of coral (Porites) - up to  $1\frac{1}{4}$ " in diameter; drill apparently struck very large colony. These corals are represented in the coarse material as are pieces of buff to tan ls. containing Halimeda fragments and mollusk shells. Finer fraction (less than  $\frac{1}{4}$ ") consists of broken coral + frag. ls with few frag. Halimeda and forams (Marginopora, chiefly).

200-210 Same as last

210-220 Similar to last two but with fewer Porites fragments. There are a few pieces of the buff to tan, dense foss. ls and in one piece this material grades into a porous, highly foss. (small forams + micro-moll) cemented ls. Think the dense mat. is derived from porous mat. by dep. of calcite. In this connection see large gast. shell lined with yellow calcite rls.

Many well preserved micro-moll. in porous layer + free in finer fraction - mostly gast. with thin-shelled pelec. such as tellinids + frags. of coarse ribbed forms. Halimeda frags rare

220-230 Larger pieces composed almost entirely of micro foss - some porous, some dense (like last); cementation is by yellow calcite and all stages may be found; rich in micro-moll.

230-240 Coarse coral; microfoss + yellow

rock mass  
calcite, rare; some large moll. shells  
& well preserved coral; many small moll  
incl. area

- 240-250 Coarse, mostly Porites and foran - moll.  
ls. similar to that above (210-220) but  
without much yellow calcite; smaller  
forams abundant in fine fraction.
- 250-260 Similar to last but higher percentage finger  
coral; Pyrgoma molds
- 260-270 Similar; rare moll. molds; 3 Lithodomus, 2  
small oysters
- 270-280 Coarse coral with frag. ls. matrix rich in  
micro-gast., some yellow calcite - some of  
gast. with traces of original color
- 280-290 Fine coral and shells with few large pieces  
coral and several pieces cemented ls. with  
Halimeda, etc.; worn moll., mostly small.
- 290-300 Mostly fines with small amt. coarse coral  
including cemented shelly ls., yellow  
calcite, worn moll.
- 300-310 Coarse coral with cemented shell debris; worn  
cardinals, small rounded pebbles
- 310-320 Few large pieces,  $\frac{2}{3}$  of them fragments of coral;  
(both massive Porites and pts of branches); other coarse  
pieces of tan, fess ls. with int. cavities. Fines mostly  
coral frag with few micro. moll., frag. larger  
shells + ech. spines, smaller forams

(see p. 43)



$$\begin{array}{r}
 5' 9'' \\
 6' \\
 6' \\
 2' 9'' \\
 \hline
 19' 18''
 \end{array}$$

20.5'

$$\begin{array}{r}
 25 \overline{) 20.5} = 82 \\
 \underline{200} \\
 50
 \end{array}$$

Core #5

Split 3 samples - J-K-L  
to date 5/28

- J - from 7-8" from top -
- K - " 2002' (approx) - not oriented per
- L - " 2003 - bottom piece

36a

med, soft and one soft spot - 3-4" each.

med, soft and one soft spot - 3-4" each

- 2.25 one for 11 12 min. of soft spots
- 12.00 noon. finished coring; last 2" were softer (1 1/2 + 3 1/2) but hardened at end; no loss of circulation.
- 1:50 PM - out of hole

Core #5  
1978-  
2003

Recovered 20'6" hard white cor. ls. (= 82%)  
Core in 34 oriented pieces + 1/2 doz short sections  
of small unoriented pieces  
Top 5'6" of core placed in Box #2,  
balance in box #3 (filling it up)

(see above)

Rock contains many reef corals, all preserved as molds as are mollusks; some cavities measure 2-3" across and are lined with calcite nls.; some corals may be in position of growth; others obviously are not in position.

ONR  
Rept. #6

Reamed to 2003 by 4:45 PM; drilled to 2005 - no cuttings; shot down to mud up

- to 15' - 16' - circulation at 2007 ft. - very low dust; loss due to 6" drop; circulation returned in 15 min ±

- drilled on to 2020 - very poor cuttings, mostly wood + Imperex

Dye Tests - core No. 5 (1978-2003) was taken, two dye tests were made to check spread of drilling fluid.

Test No. 1 -

Drilling fluid - see in log

Dye - Sodium Fluorescein - capital one 37

Amount of - 2 1/2 oz by volume

Hole depth - 2037'

Hole diameter -  $9\frac{5}{8}$  inches = 127.0"  $\div 6\frac{1}{2}$

Circulation - good.

Dye placement - in top of flow line, a pump-sucker, sealed cone which is placed directly above the bit to keep water surface directly above pump sucker. If pipe is not in pump sucker hole, it is released when fluid under pump sucker is released from the pipe.

Pump strokes - 52/min.

Drill pipe rotation - approx. 20 RPM.

Total distance dye traveled - 2037'

Time - 11 min. 31.7 seconds

Test results:

A solid green dye is found at end of 2 1/2" pipe. The fluid traveled approx. 125' / min. or 3' / sec. or 34 sec. / 100'.

Test No. 2

Approx. 3 g of a red textile dye put in suction hose in pit to check complete circuit of flowing fluid. A small amount of Impromex has been added to the fluid, but the dye should go well.

Total time - 15 min. 4 sec.

Pumps - 48 strokes

Pipe RPM - 20

Depth of hole 2037'

Total length of circuit - 4232'

In test No. 1, fluid traveled 2037' in 11 min 31.7 sec., in No. 2 fluid traveled 4232' in 15 min. 4 sec. Apparently fluid travels in the magnitude of three times as fast from pit to bottom of hole as from bottom of hole to pit.





12

20

2064

1.30. Driller notes about 3 ft  
interval 2072-2081, where  
drilling was faster - Rock softer  
though still firm.

2.00. Depth 2105.  
Circulation constant. Core  
still being steadily mixing  
to top & being removed.  
But sound as well  
this & (might explain  
almost complete lack  
of cutting - larger than  
hard bit.)

3.10. Circulation lost  
abruptly at 2124. (End  
of 2nd shift).  
Driller says bit bit "very  
rough zone for last 2 inches  
of hole run just before  
circulation stopped.

3.30 - 4.25. Mixing mud, put  
on 2nd 3 barrels from start.

4.30. Added more mud to string  
& prepared to continue drilling  
hoping that thicker mud  
circulation will restore circulation.

4.30 P.M., Circulation in well  
about 1000 ft. down about 10 ft.  
water level 10 ft. down  
even more soft - for 10 ft.  
of cavity.

4.40 Circulation better with  
down 1000 ft. 2155  
Stopped completely at 2155

4.45 - Time returned to by  
down 1000 ft. 2155

4.50 - Found 2156 - 2153  
Circulation in well  
depth 10 ft. down  
at 2153 water level  
3 ft. down of 10 ft. down. Drill  
up 10 ft. down to water  
level. Drilling was not  
near bottom without more  
lost circulation material.

Drill 10 ft. down  
from 2155 down to cavity  
at 2156 was very poor  
drill chatter & lost  
badly.

5.30 A.M. - Harry told me  
Spring 10 ft. down to go about  
10 ft. down only - (very dull)

May 28 ~ Wed 6 AM - 4 PM - Radd

6.15 rough drilling to 2155 - soft



2130 - 2155; harder 2155 - 2160

6:50 - shut down to fill pits

8:45 - unable to get back to bottom - 10' ± of cuttings; washed down to seat table.

9:10 - 2160 - 2165 - 1 ft. soft, rest firm

9:30 - 2165 - 2175 - firm, fairly uniform

9:50 out of hole to await installation of 4" water line and, incidentally to examine bit; bit badly worn with many of small teeth broken off (after 12 hrs?)

2:30 PM Back in hole with new bit

3 PM - on to 2195 - all firm; cavity 2188-89.

3:45 PM pulled up to work on pump line

4 PM - 11:30 PM.

Working on pump until 4:55.

4:55 Ran pipe into hole. Bit refused a few feet above bottom, presumably due to settlement of cuttings. Hole washed clean.

5:05 Started drilling at 2193'. Hole to 2225' at 6 PM. Zone at 2197' to 2212' gave virtually no resistance to the bit.

hrs

6:40 2200' EXCEPT FOR DEPTHS INDICATED ABOVE DRILLING HAS PROCEEDED AT ABOUT 2 MINUTES PER FT

7:05 2250' DRILLING STILL AT 2 MINUTES PER FT.

TO PG 64

# Notes on cuttings (cont. from p. 36)

320-330 Very similar to 310-320

330-340 Coarse + fine grained, dark ls. much  
or it veal to yellow calcite, some dark  
elongate areas may represent larger (fragments)  
NO → forams; coral structure obscure. Moll. shells  
rare (late Turbo operculum); forams also rare.  
this mat. quite diff from samples immediately  
above.

340-350 Similar to last but coral and mollusk  
molds much more abundant; inf.  
mold Thyris

350-360 Similar to last 2, molds large moll, both  
paleo. + gast; also small moll + forams  
with shell (contam. from above?) - (3 free  
pyisines with orig shell)

360-370 little change; gray, cavernous ls. with  
much porph. yellow calcite, corals and  
larger moll. as molds; few mixed moll. +  
many smaller forams with shell.

370-380 } Same as last - forams + small  
380-390 } moll. shells become fewer  
with depth

390-400

400-410

410-420

420-430

430-440

Similar but with well preserved corals  
and large (frag.) moll.

440-450

Like 370-420 - unalt. corals and moll.

Rare. (over)

450-460 - gray ls. + yellow calcite - higher proportion of dense pieces than above; foss-as molds

460-470 - same as last; unaltered coral + shell rare + may represent contamination from above; only forams are recryst. in yellow calcite

470-480 - Essentially same as last but note well preserved micro-moll. in finest fraction (bottles) - gast. (Caecum) also forams. In coarser fraction calcite molds of Vermetus, probably with both valves. Micro-moll. do not appear to have come from near surface, some have frag of gray ls. attached

480-490 - same as last with same moll. in finest fraction

490-500 - no essential change

500-510 - " " ; foss well pres. corals

510-520 } and Halimeda  
no essential change

520-530 } - micro-moll less abundant at lower levels

530-540

540-550

550-560

560-570

570-580

580-590

(600-625 = Core No. 2) ~~~~~ chalky ls

630-640 - Coarse cuttings of richly fossiliferous ls - less recryst. calcite in chalky matrix; moll, corals, forams. medium size shells similar to section 500-600 - plus large moll shells

Small forams + micro-moll abundant in fine fraction (both int. molds and others with shell fragments, etc.)

640-650 - same as above

(see Book 2, p 29)

43a

|       |       |                     |
|-------|-------|---------------------|
| 7:24  | 2270' | 50% fast. corals    |
| 7:40  | 2270' | Common thin corals  |
| 7:55  | 2280' | Dense 2x1mm         |
| 10:53 | 2306' | Dense same as above |

Between 2270' & 2280' all corals about 12 mm or less / ft



43

accumulated cuttings. In pit  
gas right back in after  
each shot addition. (When the shot  
going better by last no more  
darker color since 27, 28  
at present shot and  
cuttings but only a little capable  
of being washed away by the  
cut water being pumped through)

3490-3495 - very soft.

5.15 P.M. Depth 251  
accumulation of cuttings, hydrogen,  
to effect change in bit  
position (backing)

6.00 P.M. Unable to add any pipe  
because of accumulation of cuttings.

6.15 P.M. Pulled two stands  
of pipe and shot down to  
repair mud pump. (Pump  
with very low pressure;  
causes hose to whip back & forth)  
- Piece of iron pipe sandblast  
pits caused trouble.

6.45 P.M. Shot down to add a  
joint of pipe.

7.00 P.M. - back it

7.25 - Depth at end of  
shift 2523

May 29 - Thurs. 8AM - 4PM Redd

Drilled to 2527 - fairly hard, no streaks  
shot down to service rig and fill pits

- to 2555 with no change; drilled slowly, losing some water (arranging to add 3rd pump - 2" line - that should enable us to drill continuously unless large cavities are encountered)
- 10:45 - to 2556 - continues fairly hard with few rough streaks 2552-2556; shut down to fill pits and install pump 2 - this ties Bit depth
- 12:45 PM - 2556 - 2575 - fairly hard, smooth except for cavity 2565-2568; put some cuttings on this "shelf"
- 1:30 PM - 2575 - 2600' - firm except for rough spot 2582-83, soft 2582-95.
- 2:45 - 2600 - 2620' - firm except rough 2618 shut down to refill pits - pulling up
- 3:45 - hole filled 50' ± with cuttings

29 May (cont.) 4:00 AM - 12:00 AM

4:59 2637<sup>2</sup>  
 6:00 2637<sup>2</sup> Decided to take core here. Mixed mud for 2 hrs. The pumped mud into hole. Pulled pipe & put on core barrel & bit. Ran pipe by end of shift.

May 30 - Fri. - midnight to 8 AM field

- 3:30 AM start out of hole after 25' core run averaging 10 min. per ft. No soft spots but pt. (15-20') very rough.



6:00 out of hole; trip show by tight joints

coralliferous, foraminiferal

Recovery 16'5" core = 65%

Core projecting from end of bit - probably last part of bottom.

Core consists of 27 large oriented pieces (with 4 small oriented obliquely sliced fragments) and broken unoriented pieces in 1/2 doz or places.

Samples to Cole -

M - 2' 1" from top of core } unoriented chips  
N - 7' 10" " " " }

ONR Rpt  
#5

M. Russell →

12.25. Replaced several joints, having bad collars. On way back to drilling. Few double trips.

15.5. (killed) remeasured pipe -  
Samples were 1 foot short  
of bottom. This core is really  
2662 - 2687.

20.5. (killed) remeasured - starting to drill.

3:41 - D 271. 2721'

140-30

7-11-55 (555)

4:00

Drilling at 2750' at 10:00

(10:00)

5:15

From 2715 to 2740 ft. drilling was done. At 2716 ft. a small amount of rock was encountered. Rest is probably soft zone. Drilling was stopped at 2740 ft. because of lack of circulation.

8:30

2750

2800

Tool joint

Drilling from 2750 to 2800 ft. was done. Drilling was stopped at 2800 ft. because of lack of circulation. At 2800 ft. a small amount of rock was encountered. Rest is probably soft zone. Drilling was stopped at 2800 ft. because of lack of circulation.

9:40

At 2800 ft. drilling was stopped until tool joint was added. Drilling was then resumed. At 2845 ft. drilling was stopped because of lack of circulation. A sample was taken from the soft zone by using the junk bucket. Pipe was then pulled out of hole.

Although drilling was easy in soft zone, "cuttings" did not seem to pack around bit & pipe; as soon as tool joint was added, but went directly to bottom of hole. No indication of casing. No circulation, or reverse.

Lack of casing seemed to indicate that the material is not an unconsolidated or unconsolidated sand. Lack of accumulation of cuttings would seem to indicate large porosity & high permeability. (Perhaps this is Karip's Tell-O zone.)

1) - 100 ft } see below page 50  
2) - 100 ft }

See drillers report for details of drilling.







In 1951 on 5 Jan. 1951, the hole was  
 used to pump water. Sample 401  
 was taken from the bottom of the hole;  
 this sample was not used for anything.

May 31 ~ Sat. - 8 AM - 4 PM.

Spent morning adding new length 9 5/8 casing  
 and testing; unable to raise or turn string;  
 how top section became loosened is something  
 of a mystery. Repaired swivel.

Took hole to 11 AM with diamond drill  
 12.45 PM drilled 5' (3052 - 3057) without  
 water, burning bit at end of run.

Recovered 3' (=100%) of fine-grained  
 limestone with hard masses; drilling time  
 per foot 2+1+1 (approx)

Back in hole with 3 3/4 inch bit

4 PM - midnight - 7000 ft + 1200 ft  
 Casing - 1200 ft - 1200 ft - 1200 ft  
 1200 ft - 1200 ft - 1200 ft - 1200 ft

3:05 AM - 3:05 AM - 3:05 AM - 3:05 AM  
 3:05 AM - 3:05 AM - 3:05 AM - 3:05 AM

TOPOC INSTRUMENT 1200 ft  
 3:05 AM - 3:05 AM - 3:05 AM - 3:05 AM

10.50 PM - 10.50 PM - 10.50 PM - 10.50 PM  
 10.50 PM - 10.50 PM - 10.50 PM - 10.50 PM

## Notes on Core #8 - 3356 - 3353'

Material is coarser than chalky material that makes up most of core #1 and contains a much higher proportion of material that clearly is organic. Mollusks occur as poorly preserved and fragmentary molds; some of corals are coarsely xl casts; small forams (discoid types) appear ne xl'ed; questionable larger forams; almost perfect xl spheres that may be forams; + radiolites and small horn-shaped structures of uncertain affinities.

(Sample P to Cole 6/1/52 ✓

5/a

COVC # 6  
250-53



[illegible]

39

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

END OF BOOK 1

